

Types of Nebulae and Galaxies:

Nebulae-comes after a supernova and is usually a really vibrant cloud

Types of nebulae:

Bright nebulae

Dark nebula

Emission nebula

Planetary nebula

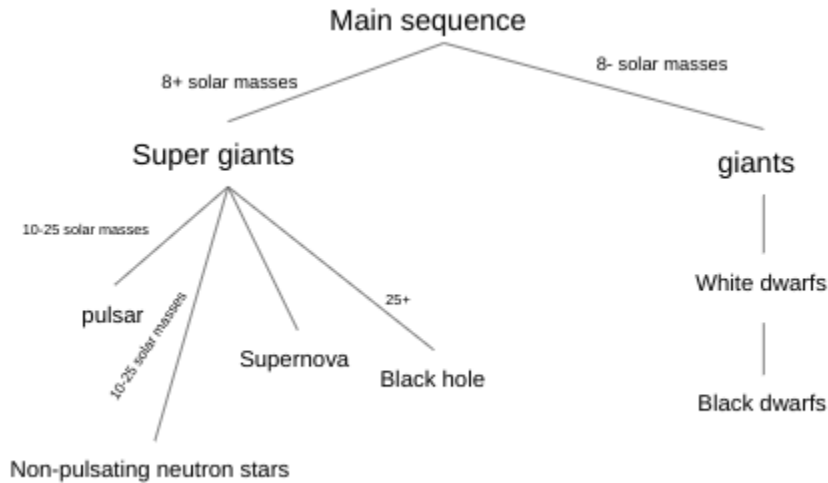
Reflection nebula

Variable nebula

Globular cluster-a cluster of tightly packed stars

open clusters-A few really bright stars

Life cycle of a star



Main sequence stars come from proto stars who come from supernova

Scientific notation

1.7×10^{48}

How many digits are in the number

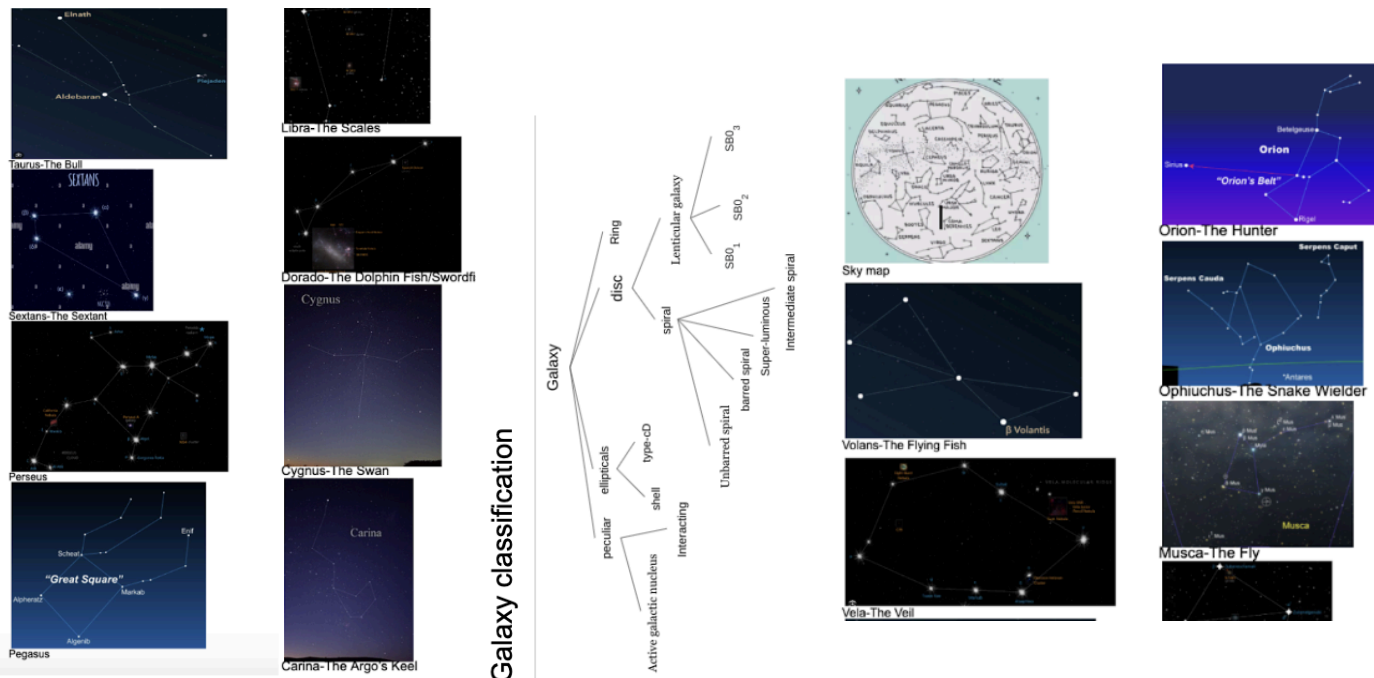
The first digits of the number

Telescope:

Big lens in the front to collect light and then the light hits a mirror to go up to your eye

**If you see multiple units, put the one listed first!
Unless asked**

Constellations:



ProtoStar formation:

Star formation happens when, in large, dark, and very cold clouds of gas and dust, a clump of gas reaches a critical mass. This is the point where the gas has enough gravity to pull more gas into it, making its gravity well deeper, sucking in more gas, causing a positive feedback loop throughout the gas cloud. A protostar is formed as gravity begins to pull the gasses together into a ball. This process is known as accretion. As gravity pulls the gasses closer to the center of the ball, gravitational energy begins to heat them, causing the gasses to emit radiation. At first, the radiation simply escapes into space. As accretion happens, protoplanetary rings begin to form around the protostar. In the protoplanetary rings, large clumps of stuff grow and suck up materials. These eventually become the planets. This positive feedback loop continues for a while, but eventually a protostar becomes a main sequence star when its core temperature exceeds 10 million Kelvin and it begins fusion and it continues its life.

NGC 1555

sometimes known as Hind's Variable Nebula, Sh2-238 or HH 155, is a variable nebula 4 light years across,^[2] illuminated by the star T Tauri, located in the constellation Taurus. It is 400 light years away from Earth in the Taurus Molecular Cloud, and has a magnitude (B) or in terms I can understand 9.98. It is also in the second Sharpless catalog as 238. It might be Herbig-Haro object which means it might have newborn stars inside it.^[4] The nebula was discovered on October 11, 1852, by John Russell Hind. It has a right ascension of 4^h21^m57.1^s or 66.96° 1.1686725 radians from the vantage point of the sun and a declination of +19°32'7" declination is ascension from the Earth vantage point and because Earth moves it is a lot it is more involved and useless. In pictures it is a little arch of dust with the massive (from our point of view) with the massive T Tauri taking up most of the image

Barnard 68

Is a dark nebula at 407 light years away it's radius is 0.25 light years it is so dark you can't see it in the visible wavelength it is 16K or -431 °F it is in the Ophiuchus constellation it's right ascension of 17^h 22^m 38.2^s or 260.66° or 4.549375228 radians. In pictures it is a big black splotch.

T Tauri

A whole type of stars was named after it a star being under 10 million years old it is 1 million years old and it is in the constellation Taurus it was discovered in October, 1852, by John Russell presumably October 11 do to it's proximity to NGC 1555 which he also discovered but it seems no one else has made this connection it is a star system with T Tauri North AKA T Tauri N, T Tauri south AKA T Tauri S and T Tauri south B AKA T Tauri SB but T Tauri north is 300 AUs away it is mainly seen in inferred as it blocked by a Accretion disk or more specifically a Circumstellar ring but you can see T Tauri north the "south stars have a magnitude of less than 19.6 it has 3 protoplanetary disk one for each star just take each of the stars AKA names and add protoplanetary disk a protoplanetary disk is a disk circumstellar disk or Accretion disk it has a right addition of 04h 21m 59.43445s or 65.5° or 1.143191 radians. For pictures (see NGC 1555)

HD 95086

Or Aiolos It is a star about 282 light years away it has a low Fe/H index of -0.25±0.5 (~55%) which is a measure of metal for reference -2.47 is the average so this star has a lot of metal but not more than our sun which has 0 by definition it is 13.3 million years old and is 1.6 solar masses making it a A type star it is in the same system as HD 95086 B an exoplanet that was named Levantes 5x larger than Jupiter it orbits at 70 AUs it was discovered by Rameau and using the aptly named very large telescope it is very red. It is in the constellation Carina Right ascension 10^h 57^m 03.02157^s 164.26° or 2.866877829 radians.

NGC 3324

Is an open cluster 9,100 ly away from the Earth it is 30 ly across it combined with the emission nebula IC 2599 AKA gum 31 they are called Gabriela Mistral Nebula it's in the constellation Carina. Right ascension of 10^h 37^m 20^s 159.33° or 2.780833097 radians

V1057 Cygni

Is a binary star V1057 Cygni is a variable star which does particular change in magnitude and was the second star discovered to change this much it went from a type dke (one of the lowest types of star) to F-type supergiant (one of the highest) in, get this, 1! year the test might call this a "nova like event") its companion component B or V1057 Cygni B was discovered in 2016 it is in the constellation cygnus right ascension 20^h 58^m 53.73367^s 314.73° or 5.493074755 radians.

Baby boom Galaxy

Creates 4,000 stars per year (400X the milky way) making it a starburst galaxy it is also the brightest starburst galaxy it is in the constellation Sextans it has a right ascension of 11^h 0^m 54.52^s 165.23° or 2.88380752 radians

40 Dorados

A.K.A the Tarantula Nebula it is in the constellation Dorado it was discovered in 1751 it has a black hole in it which is pretty cool in pictures it is a bunch of red dust with a hole in it surrounded by white dust it is the 8th largest galaxy ever discovered

HD 141569

It is a binary star system but 2 of the stars are red dwarfs it also has 2 rings of dust and potentially a 3rd

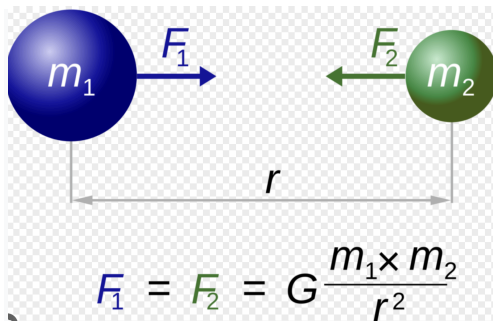
Newton's laws of motion

Every object in a state of uniform motion will remain in that state of motion unless an external force acts on it.

Force equals mass times acceleration

For every action there is an equal and opposite reaction

Gravity Theory



Where G or the gravitational constant is $=6.674 \times 10^{-11}$

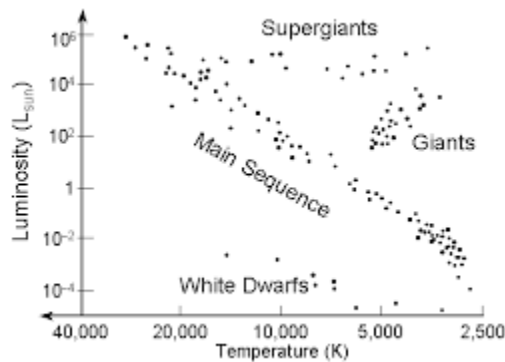
m_1 is the mass of the 1st object and m_2 is the mass of the second and R is the distance between the 2 objects and F is the gravitational force

Kepler's 3 laws

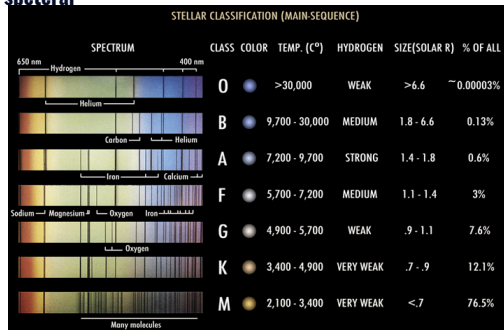
- 1.) How planets orbit in ellipses
- 2.) A planet's orbits at a constant rate
- 3.) A planet's orbital period is proportional to the size of its orbit (the proportion is its period³=radius (or semi major axis) squared)

Stellar classifications

H-R classification



Spectral



Color according to chromaticity

O-blue
 B-deep bluish white
 A--Bluish white
 F-white
 G-yellowish white
 k-Pale yellowish white
 M-Light Orangish red

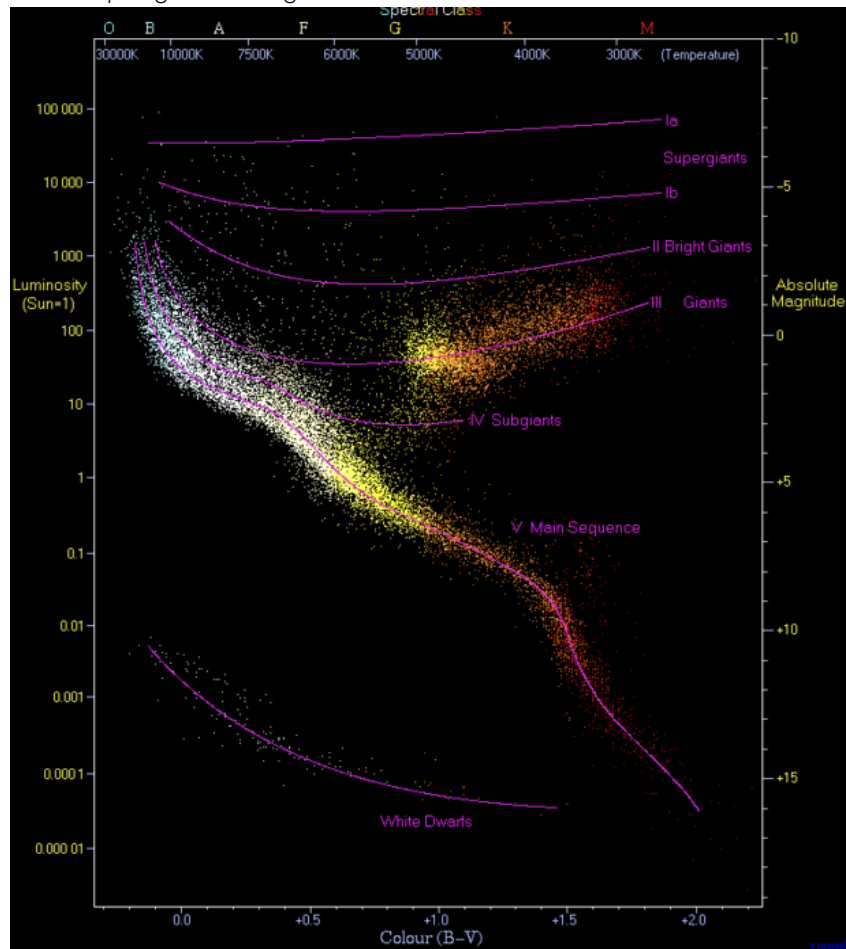
Yerkes:

Yerkes luminosity classes

Luminosity class	Description	Examples
O or Ia ⁺	hypergiants or extremely luminous supergiants	Cygnus OB2#12 – B3-4Ia ⁺ ^[22]
Ia	luminous supergiants	Eta Canis Majoris – B5Ia ^[23]
Iab	intermediate-size luminous supergiants	Gamma Cygni – F8Iab ^[24]
Ib	less luminous supergiants	Zeta Persei – B1Ib ^[25]
II	bright giants	Beta Leporis – G0II ^[26]
III	normal giants	Arcturus – K0III ^[27]
IV	subgiants	Gamma Cassiopeiae – B0.5IVpe ^[28]
V	main-sequence stars (dwarfs)	Achernar – B6Vep ^[25]
sd (prefix) or VI	subdwarfs	HD 149382 – sdB5 or B5VI ^[29]
D (prefix) or VII	white dwarfs ^[d]	van Maanen 2 – DZ8 ^[30]

Mount willson:

sd:subdwarf
D:dwarf
Sg:subgiant
G:giant
C:supergiant
The Hertzsprung–Russell diagram



Other
Ly means light years
Bigger stars burn hotter and thus brighter